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Enhanced Transcoding of Structured Documents
Through Use of Annotation Techniques
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106 105 trans-coded page 104 trans-coding engine 103 modified page annotation engine 102 101 annotated page

FIG. 1A

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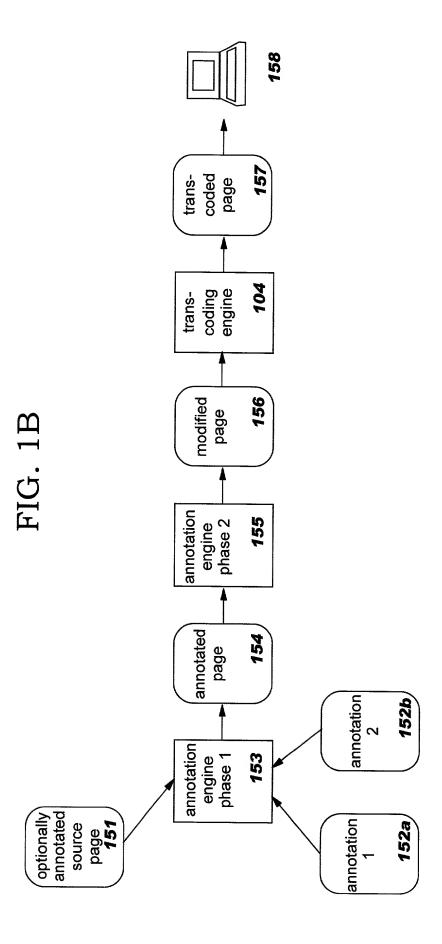


FIG. 2A

<u> 200</u>

```
<html>
    <head>
    <title>Internal Annotation Example</title>
    <body>
210 Here is the first sentence.
     <!--
      <?xml version="1.0" encoding="ISO-8859-1"?>
      <annot version="1.0">
220
       <remove/>
      </annot>
                     230
     And here is another sentence.
240 <b>Hello world.</b>
     </body>
     </html>
```

FIG. 2B

<u> 250</u>

```
<html>
<head>
<title>Internal Annotation Example</title>
<body>

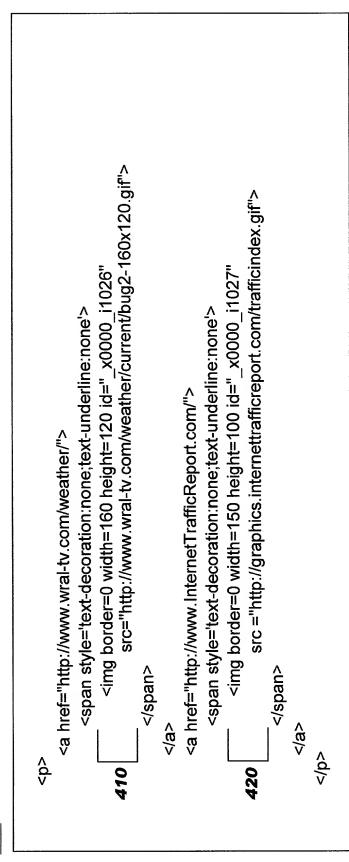
210 Here is the first sentence.

</body>
</html>
```

FIG. 3 (PRIOR ART)

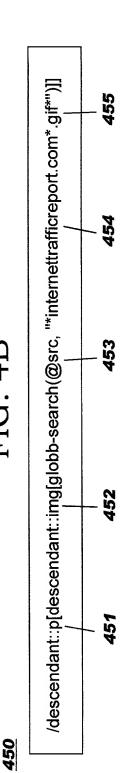
Globbing Pattern	Regular Expression	Explanation
"abc"	"^abc\$"	The string "abc".
"abc*def."	"^abc.*def\.\$"	The string starting with "abc" and ending with "def.".
"*abc*"	"abc"	A string containing "abc".
"*{ab,cd}*ter."	"(ab cd).*ter\.\$"	A string containing "ab" or "cd" which ends with "ter.".

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400

FIG. 4A

FIG. 5A

500

FIG. 5B

```
<html>
<head>
<body>
Here is the first sentence.
And here is another sentence.
<b>Hello world.</b>
</body>
</html>
```

009

```
<description target="/descendant::P[descendant::text()[contains(.,'IBM')]]"</pre>
                                                                                                                                                                                                                            match-key="/display.gray4/device.pda/device.cellphone/">
                                                                      <description take-effect="before" target="/descendant∷TR[2]"
                                                                                                  match-key="/display.small/device.cellphone/">
                                                                                                                                                                                                                                                                 620
                                                                                                                                  610
                                                                                                                                                                                                                                                                                                                            <re><remove tag="IMG" />
                                                                                                                                                                                                                                                      < take-effect-before>
                                                                                                                                                                                                                                                                                                                                                     </take-effect-before>
                                                                                                                                                                                                                                                                                                                                                                                                                                                           </ take-effect-after>
                                                                                                                                                                                                                                                                                                                                                                                                       < take-effect-after>
<?xml version='1.0' ?>
                       <annot version="1.0">
                                                                                                                                                                                                                                                                             </usnd>
                                                                                                                                                                                                                                                                                                      <keep/>
                                                                                                                                                                                                                                                                                                                                                                                                                                  </dod>
                                                                                                                             <re></e>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    </description>
                                                                                                                                                     </description>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      </annot>
```

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FIG. 7A

FIG. 7B

```
<html>
          <head>
          <TITLE>A Simple Example To Illustrate Table Scoped Clipping</TITLE>
         </head>
          <body>
          <H1>HTML is Easy To Learn</H1>
750
          <TABLE>
760
          <TR>
          <TD> Cars</TD>
          <TD> Colors</TD>
          <TD> Interiors</TD>
          </TR>
          <TR>
770
          <TD> 2 Door</TD>
          <TD> Red</TD>
          <TD> Leather</TD>
          </TR>
          </TABLE>
          <P>Welcome to the world of HTML.
          This is the first paragraph. While short it is
          still a paragraph!</P>
          <P>And this is the second paragraph.</P>
          </body>
          </html>
```

FIG. 7C

<u>760</u>

```
<html>
  <head>
  <TITLE>A Simple Example To Illustrate Table Scoped Clipping</TITLE>
 </head>
  <body>
  <TABLE>
  <TR>
  <TD> Cars</TD>
  <TD> Colors</TD>
  <TD> Interiors</TD>
  </TR>
  </TABLE>
  <P>Welcome to the world of HTML.
  This is the first paragraph. While short it is
  still a paragraph!</P>
  <P>And this is the second paragraph.</P>
  </body>
  </html>
```

FIG. 9A

```
<?xml version='1.0' ?>
    <annot version="1.0">
      <description take-effect="before" target="/descendant::FORM[1]">
         <replace>
             <form>
                <text>NEW prompt for INPUTTEXT3(now a select)</text>
                <field name="INPUTTEXT3" type="SELECT">
                    <option value="No" label="No." />
                    <option value="Yes" label="Yes." />
                    <option value="Maybe" label="Don't Care" />
910
                </field>
       920
                <text>NEW prompt for INPUTTEXT2</text>
                <field name="INPUTTEXT2" value="bottle washer" />
                <field name="INPUTTEXT1" value="Bob Jones" type="HIDDEN" />
                <field type="SUBMIT" />
              </form>
         </replace>
       </description>
     </annot>
```

```
If annotation has been applied, the first input field will be made hidden and given a default value,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   box, and the second input field will have a new default value (if default values are supported by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the third input field will become the first input field listed and will also be converted into a select
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <INPUT TYPE=TEXT NAME="INPUTTEXT1" SIZE=25 VALUE="Bob Smith"><BR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 <!NPUT TYPE=TEXT NAME="INPUTTEXT2" SIZE=25 VALUE="cook"><BR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <INPUT TYPE=TEXT NAME="INPUTTEXT3" SIZE=25 VALUE="Blue"><BR>
                                                                                                                                                                                                                                            <META content="text/html; charset=iso-8859-1" http-equiv=Content-Type>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                <INPUT TYPE=SUBMIT NAME="SUBMIT" VALUE="RESPOND">
                                                                                                                                                                                                                                                                                     <META content="MSHTML 5.00.2722.2800" name=GENERATOR>
                                                                                                                                                                                                                                                                                                                                                                                                       <H1 ALIGN="center">Form Example </H1> <BR>
FIG. 9B
                                                                                                                                                                                                                                                                                                                                                                    <BODY bgColor=#ffffff text=#000000>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     <B>Prompt For INPUTTEXT1</B>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 <B>Prompt for INPUTTEXT2</B>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           <B>Prompt for INPUTTEXT3</B>
                                                                                                                                                                                                                <TITLE>Form Test Page</TITLE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the device)<BR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 </FORM>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        <FORM>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      </BODY>
                                                                                                                                                                                                                                                                                                                                     </HEAD>
                                                                                                                                                                               <HEAD>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           </HTML>
                                                                                                                                          <HTML>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       940
```

FIG. 9C

```
converted into a select box, and the second input field will have a new default value (if
                                                                                                                                                                                                                                                                                                        default value, the third input field will become the first input field listed and will also be
                                                                                                                                                                                                                                                                          If annotation has been applied, the first input field will be made hidden and given a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             <input type="TEXT" name="INPUTTEXT2" size="25" value="bottle washer">
                                                                                             <META content="text/html; charset=iso-8859-1" http-equiv=Content-Type>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 <input type="HIDDEN" name="INPUTTEXT1" value="Bob Jones">
                                                                                                                                <META content="MSHTML 5.00.2722.2800" name=GENERATOR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     <input type="SUBMIT" name="SUBMIT" value="RESPOND">
                                                                                                                                                                                                                                             <H1 ALIGN="center">Form Example </H1> <BR>
                                                                                                                                                                                                                                                                                                                                                                            default values are supported by the device)<BR>
                                                                                                                                                                                                                                                                                                                                                                                                                                               NEW input for INPUTTEXT3(now a select)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  <option value="Maybe">Don't Care
                                                                                                                                                                                                          <BODY bgColor=#fffff text=#000000>
                                                                 <TITLE>Form Test Page</TITLE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <select name="INPUTTEXT3">
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NEW prompt for INPUTTEXT2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            <option value="Yes">Yes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <option value="No">No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         </select>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     </FORM>
                                                                                                                                                                                                                                                                                                                                                                                                                    <FORM>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     </BODY>
                                                                                                                                                                               </HEAD>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           </HTML>
                                   <HEAD>
<HTML>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                096
```

FIG. 11A1

FIG. 11A2 FIG. 11A1

FIG. 11A

1100

```
<insertcomment> This should be inserted into the HTML Source </insertcomment>
                                                                                                                                                                                                                                                                                                                                                                                                                      1120<insertattribute name="summary" value="Added Summary for the table" />
                                                                      <comment> This is the ExternalAnnotationTest.html page </comment>
                                                                                                                                                                                                                                                                                                     <description takẽ-effect="before" target="/descendant∷TABLE[1]">
                                                                                                                                               <description take-effect="before" target="/HTML[1]/BODY[1]/*[1]">
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     <description take-effect="after" target="/descendant::TABLE[1]">
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <column index="1" clipping="remove" />
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        <column index="*" clipping="keep" />
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <rp><row index="2" clipping="remove" />
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                <rp><row index="*" clipping="keep" />
                                                                                                                                                                                                                                                                1110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1130 
<?xml version="1.0" ?>
                                     <annot version="1.0">
                                                                                                                                                                                             <re><re></re></re>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  </description>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     <re><re></re></re>
                                                                                                                                                                                                                                    </description>
                                                                                                                                                                                                                                                                                                                                                       <keep />
```

</description>

FIG. 11A2

```
target="/descendant::TABLE[2]/TBODY[1]/TR[1]/TH[3]/text()">
                                                                                                                                                                                                                                                                     target="/descendant::TABLE[2]/TBODY[1]/TR[1]/TH[3]/text()">
                          target="/descendant::TABLE[2]/TBODY[1]/TR[1]/TH[1]/*[1]">
                                                                                                                                              target="/descendant::TABLE[2]/TBODY[1]/TR[1]/TH[1]/*[1]">
                                                                                                                                                                                                                                          <description take-effect="before"
<description take-effect="before"
                                                                                                                                                                                                                                                                                                                                                                 <description take-effect="after"
                                                                                                                     <description take-effect="after"
                                                                                                                                                                                                                                                                                                                                       </description>
                                                                                                                                                                                                              </description>
                                                                                         </description>
                                                                                                                                                                                                                                                                                                                                                                                                                                                            </description>
                                                                                                                                                                                                                                                                                                                                                                                                                               <re><re></e>
                                                                                                                                                                                    <re><re></re>
                                                                                                                                                                                                                                                                                                         <keep />
                                                             <keep />
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          </annot>
```

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FIG. 11B

```
<HTML>
<HEAD>
<TITLE>External Ano</TITLE>
</HEAD>
<BODY>
<B>Hello world.</B>
<TABLE>
<TR><TH>Cars</TH><TH>Colors</TH><TH>Interiors</TH></TR>
<TR><TH>2 Door</TH><TH>Red</TH><TH>Leather</TH></TR>
<TR><TH>4 Door</TH><TH>Blue</TH><TH>Cloth</TH></TR>
<TR><TD>Convertible</TD><TD>Black</TD><TD>Vinyl</TD></TR>
</TABLE>
Remove This text.
<TABLE>
<TR><TH><B>Warranty</B></TH><TH><B>Length</B></TH>
    <TH>Restrictions</TH>
</TR>
<TR><TH>Silver</TH><TH>2 Years</TH><TH>Yes</TH></TR>
<TR><TH>Gold</TH><TH>5 Years</TH><TH>No</TH></TR>
</TABLE>
</BODY>
</HTML>
```

FIG. 11C

```
<HTML>
       <HEAD>
       <TITLE>External Annotation</TITLE>
       </HEAD>
        <BODY>
       <!-- This should be inserted into the HTML Source -->
1170
                       1180
        <TABLE summary="Added Summary for the table">
        <TR><TH>Colors</TH><TH>Interiors</TH></TR>
        <TR><TH>Blue</TH><TH>Cloth</TH></TR>
        <TR><TD>Black</TD><TD>Vinyl</TD></TR>
        </TABLE>
        <B>Warranty</B>
        Restrictions
        </BODY>
        </HTML>
```

FIG. 12A

<u>1200</u>

ITEM	BUY	SELL
ibm	\$100	\$120
lotus	\$80	\$75

FIG. 12B

ITEM BUY SELL ibm \$100 \$120 lotus \$80 \$75

FIG. 12C

<u>1210</u>

ITEM
ibm
BUY
\$100
SELL
\$120
ITEM
lotus
BUY
\$80
SELL
\$75

FIG. 13A

1300

FIG. 13B

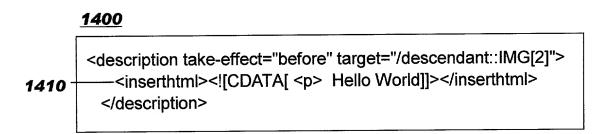
1320

```
<description take-effect="before"
    target="/HTML[1]/BODY[1]/*[1]"

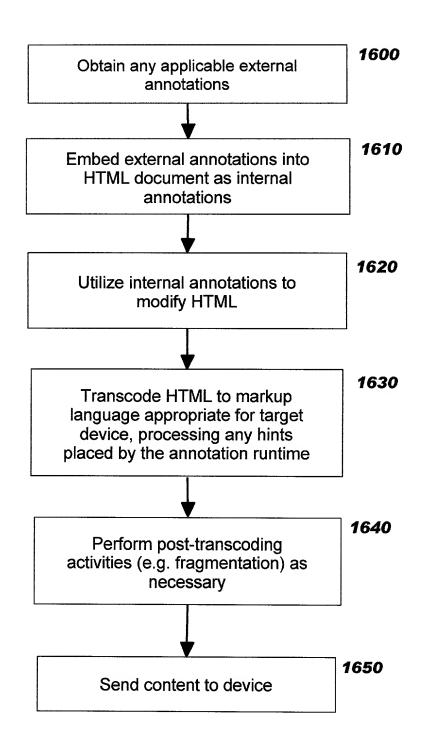
1330 condition="((User_Agent=Mozilla/4.*) | (User_Agent=Mozilla/5.*))
    &amp;!(User_Agent=*MSIE*)" >
    <remove />
    </description>
```

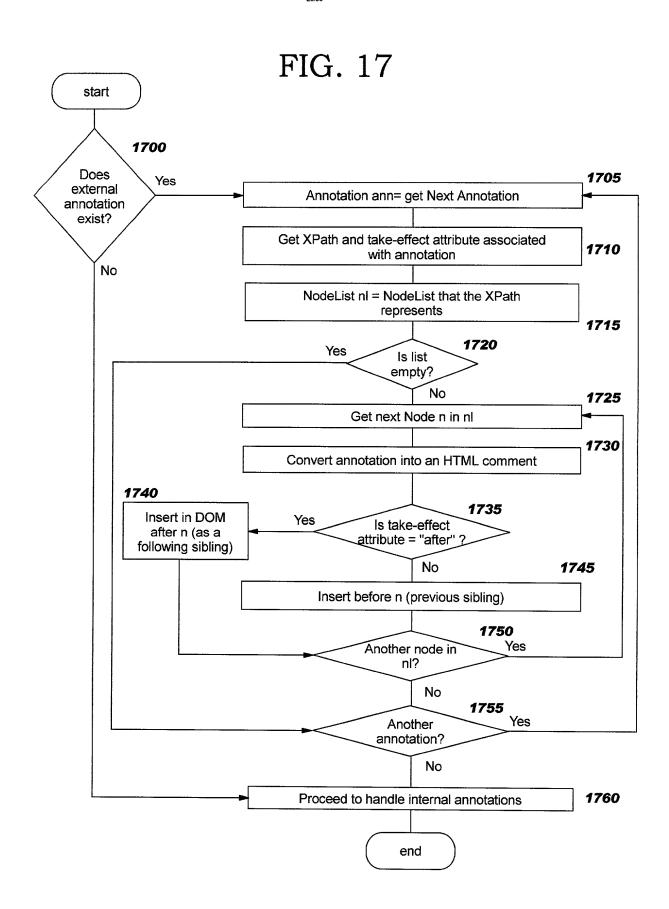
FIG. 13C

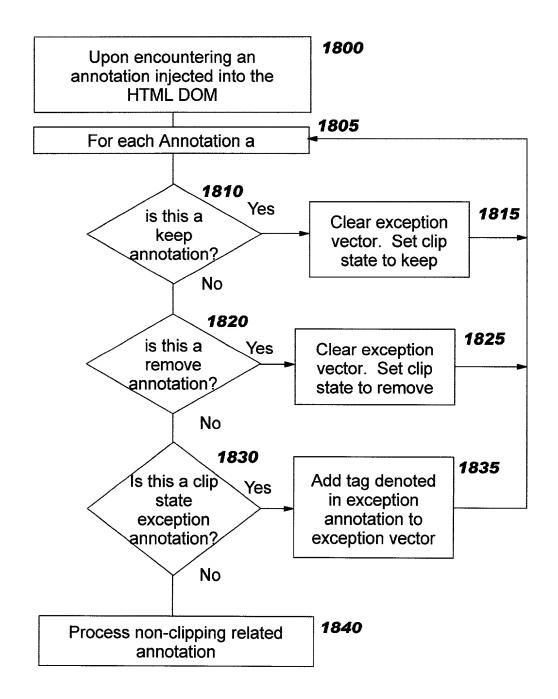
```
<!--
<?xml version="1.0" encoding="ISO-8859-1"?>
<annot version="1.0" condition="((User_Agent=Mozilla/4.*) |
    (User_Agent=Mozilla/5.*)) & amp; !(User_Agent=*MSIE*)">
    <remove/>
    </annot>
--!>
```



```
<insertmarkup>
<![CDATA[<do type="accept" label="Next"> <go href="#Second_Card"/></do>
</insertmarkup>
```







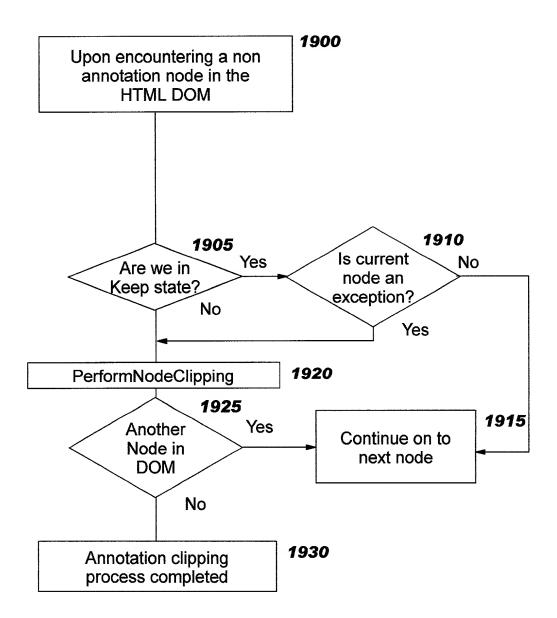


FIG. 20

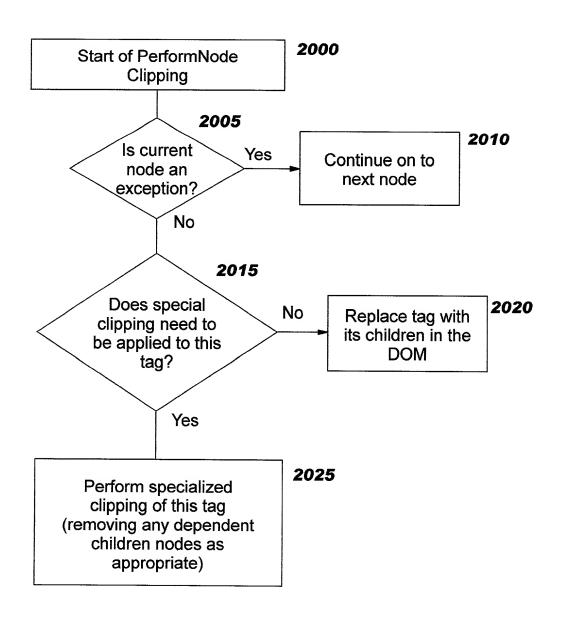


FIG. 21A

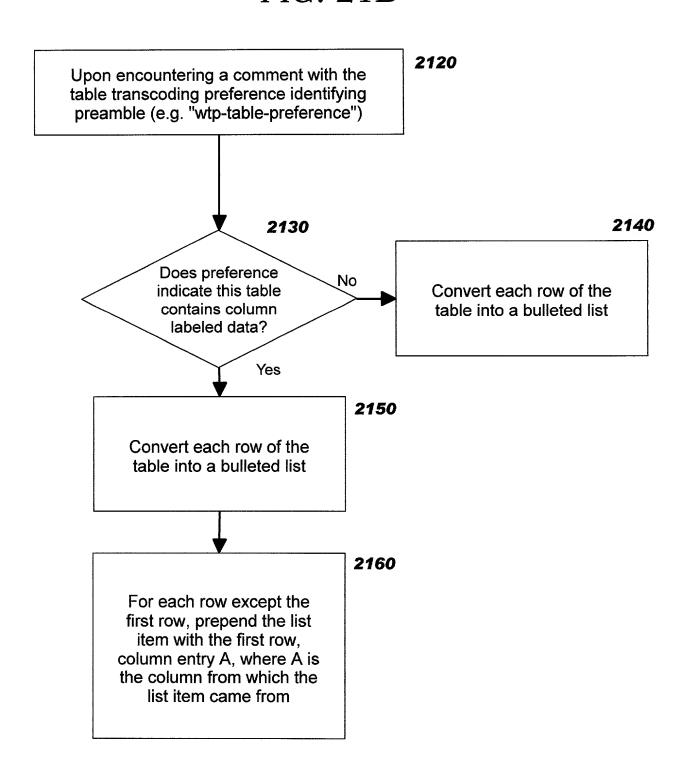
Obtain preference value annotation for this table

2110

2100

Create a new comment node that contains identifying preamble (e.g. "wtp-table-preference") plus the extracted table preference key value pair

FIG. 21B



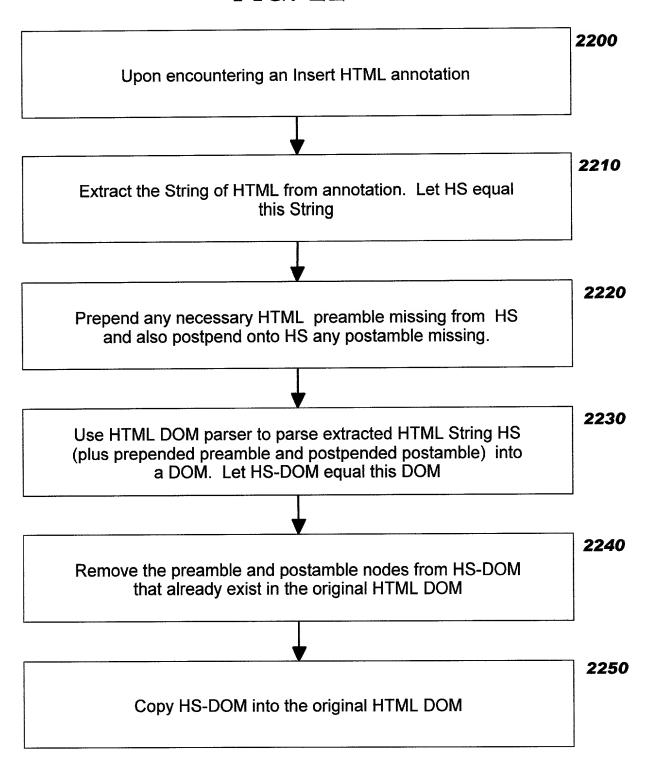


FIG. 23A

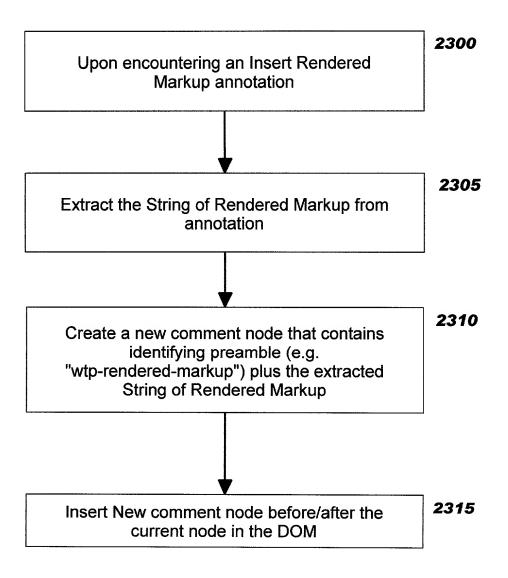


FIG. 23B

2320 Upon encountering a comment with the rendered markup identifying preamble (e.g. "wtp-rendered-markup") 23205 Extract the String of Rendered Markup from the content. Let RM equal this String 2330 Determine thec ontent-type of rendered markup that surrounds this comment by checking the http content-type header for the response 2335 Determine the appropriate markup preamble and postamble based on the content-type. Prepend this preamble onto the RMand postpend the postamble 2340 Select the appropriate DOM parser for the content type of the markup 2345 Use selected DOM parser to parse RM (plus prepended preamble and postpended postamble) into a DOM. Let RM-DOM equal this DOM 2350 Remove the preamble and postamble nodes from RM-DOM that already exist in the original rendered markup DOM 2355 Copy RM-DOM into the original rendered markup DOM